IN THE CLAIMS

Claim 1 has been amended as follows:

1. (Currently amended) A computerized method for classifying plaque in a blood vessel of a living subject ~~in which blood flows in a flow direction,~~ comprising the steps of:

~~obtaining~~ implementing a magnetic resonance imaging sequence to obtain data representing a first magnetic resonance image with a first intensity distribution of a cross-section~~, substantially transverse to said flow direction,~~ of a vessel containing plaque in a living subject;

injecting contrast agent that interacts with said plaque into the vascular system of said subject, said contrast agent interacting non-uniformly with said plaque with respect to time and thus producing different intensity distributions in said plaque in a time period;

~~obtaining~~ in said time period, re-implementing said magnetic resonance imaging sequence to obtain data representing a second magnetic resonance image of said cross-section of said vessel and said plaque therein with a second intensity distribution after a first time duration following injection of said contrast agent;

~~obtaining~~ in said time period, again re-implementing said magnetic resonance imaging sequence to obtain data representing a third magnetic resonance image of said cross-section of said vessel and said plaque therein with a third intensity distribution after a second time duration following injection of said contrast agent, said second and third intensity distributions differing from each other due to said non-uniform

invention of said contrast agent with said plaque in said time period; and

in a computer, classifying said plaque dependent on said first, second and third intensity distributions to produce a classification result and presenting said classification result in a visually perceptible display at said computer.

2. (Original) A method as claimed in claim 1 comprising classifying said plaque in different classes of plaque dependent on propensity to dislodge from said vessel.

3. (Original) A method as claimed in claim 1 comprising selecting said first time duration to lie within an enrichment phase of said contrast agent in said plaque.

4. (Original) A method as claimed in claim 1 comprising selecting said time duration as approximately one minute.

5. (Original) A method as claimed in claim 3 comprising selecting said second time duration to lie within a flushing phase of said contrast agent in said plaque, following said enrichment phase.

6. (Original) A method as claimed in claim 5 comprising selecting said second time duration as approximately three minutes.

7. (Original) A method as claimed in claim 1 comprising selecting a same region of said subject in each of said first, second and third magnetic resonance images and determining the respective first, second and third intensity distributions in said region.

8. (Original) A method as claimed in claim 7 comprising defining a same line in each of said first, second and third magnetic resonance images, and determining the respective first, second and third intensity distributions along said line.

9. (Original) A method as claimed in claim 1 comprising classifying said plaque in a plurality of classes including a class representing plaque composed of fat deposits.

10. (Original) A method as claimed in claim 1 comprising classifying said plaque in a plurality of classes including a class representing plaque composed of small vessels.

11 (Original) A method as claimed in claim 1 comprising classifying said plaque in a plurality of classes including a class representing plaque composed of inflammations.

12. (Original) A method as claimed in claim 1 comprising classifying said plaque in a plurality of classes including a class representing plaque composed of fibrous tissue.

13. (Original) A method as claimed in claim 1 comprising classifying said plaque in a plurality of classes including a class representing plaque composed of calcifications.

14. (Original) A method as claimed in claim 1 wherein the step of classifying said plaque comprises classifying said plaque in respective classes representing plaque composed of deposits, plaque composed of small vessels, plaque composed of inflammations, plaque composed of fibrous tissue, and plaque composed of calcifications.

15. (Original) A method as claimed in claim 1 comprising obtaining said data for said first, second and third magnetic resonance images using a FLASH sequence.

16. (Original) A method as claimed in claim 1 comprising injecting Gd-DTPA into the vascular system of said subject as said contrast agent.

Claim 17 has been amended as follows:

17. (Currently amended) A magnetic resonance imaging apparatus comprising:

a magnetic resonance scanner adapted to receive a living subject therein, said subject having a vascular system with vessels ~~in which blood flows in a flow direction, said vessels~~ containing plaque;

a contrast agent injector adapted to inject contrast agent, that ~~interact which~~ interacts with said plaque, into the vascular system of the living subject situated in said magnetic resonance scanner, said contrast agent interacting non-uniformly with said plaque with respect to time and thus producing different intensity distributions in said plaque in a time period;

a system computer connected to said magnetic resonance scanner for operating said magnetic resonance scanner to implement a magnetic resonance imaging sequence to obtain data ~~for~~ representing a first magnetic resonance image with a first intensity distribution of a cross-section, ~~substantially transverse to said flow direction,~~ of a vessel at the subject and said plaque therein, of said subject before injecting said contrast agent, and to re-implement said magnetic resonance

imaging sequence to obtain ~~representing obtaining~~ data ~~for~~ in said time period that represent a second magnetic resonance image of said cross-section of said vessel and said plaque therein with a second intensity distribution after a first time duration following injection of said contrast agent, and to again re-implement said magnetic resonance imaging sequence to obtain ~~for obtaining~~ data ~~for~~ in said time period that represent a third magnetic resonance image of said cross-section of said vessel and said plaque therein with a third intensity distribution after a second time duration following injection of said contrast agent, said second and third intensity distributions differing from each other due to said non-uniform invention of said contrast agent with said plaque in said time period; and

a diagnostic computer supplied with said data for said first, second and third magnetic resonance images for classifying said plaque dependent on said first, second and third intensity distributions.

18. (Original) An apparatus as claimed in claim 17 wherein said diagnostic computer classifies said plaque in different classes of plaque dependent on propensity to dislodge from said vessel.

19. (Original) An apparatus as claimed in claim 17 wherein said system computer sets said first time duration to lie within an enrichment phase of said contrast agent in said plaque.

20. (Original) An apparatus as claimed in claim 17 wherein said system computer sets said time duration as approximately one minute.

21. (Original) An apparatus as claimed in claim 19 wherein said system computer sets said second time duration to lie within a flushing phase of said contrast agent in said plaque, following said enrichment phase.

22. (Original) An apparatus as claimed in claim 21 wherein said system computer sets said second time duration as approximately three minutes.

23. (Original) An apparatus as claimed in claim 17 wherein said system computer operates said magnetic resonance scanner to obtain data from a same region of said subject in each of said first, second and third magnetic resonance images and wherein said diagnostic computer determines the respective first, second and third intensity distributions in said region.

24. (Original) An apparatus as claimed in claim 23 wherein said diagnostic computer defines a same line in each of said first, second and third magnetic resonance images, and determines the respective first, second and third intensity distributions along said line.

25. (Original) An apparatus as claimed in claim 17 wherein said diagnostic computer classifies said plaque in a plurality of classes including a class representing plaque composed of fat deposits.

26. (Original) An apparatus as claimed in claim 17 wherein said diagnostic computer classifies said plaque in a plurality of classes including a class representing plaque composed of small vessels.

27 (Original) An apparatus as claimed in claim 17 wherein said diagnostic computer classifies said plaque in a plurality of classes including a class representing plaque composed of inflammations.

28. (Original) An apparatus as claimed in claim 17 wherein said diagnostic computer classifies said plaque in a plurality of classes including a class representing plaque composed of fibrous tissue.

29. (Original) An apparatus as claimed in claim 17 wherein said diagnostic computer classifies said plaque in a plurality of classes including a class representing plaque composed of calcifications.

30. (Original) An apparatus as claimed in claim 17 wherein said diagnostic computer classifies said plaque in respective classes representing plaque composed of deposits, plaque composed of small vessels, plaque composed of inflammations, plaque composed of fibrous tissue, and plaque composed of calcifications.

31. (Original) An apparatus as claimed in claim 17 wherein said system computer operates said magnetic resonance scanner to obtain said data for said first, second and third magnetic resonance images using a FLASH sequence.

32. (Original) An apparatus as claimed in claim 17 wherein said contrast agent injector injects Gd-DTPA into the vascular system of said subject as said contrast agent.

33. (Previously presented) An apparatus as claimed in claim 17 wherein said contrast agent injector is operated by said system computer to inject said contrast agent.